

CLAIMS

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comprise at least one duct or interspace (11,11b,11c,11d;11*;11[^]) being present between an outer part (7;50;7*;7[^]) of said body (2,30;2',30;2,31;C,2*;2[^]) and said inner parts (12,30;30';31;12*;CE,12[^]) and/or said elements and/or substances (10,30b;24;28,28u;10*;CE) being present in said body (2,30;2',30;2,31;C,2*;2[^]).

- 5 8. Device according to the previous claim, characterized in that said at least one duct or interspace (11,11b,11c,11d;11*;11[^]) is provided with an inlet (3,3';3[^]) and an outlet (4;4';4[^]) being defined in said body (2,30;2',30;2,31;C,2*;2[^]), preferably in said outer part (7;50;7*;7[^]).
- 10 9. Device according to claim 7 or 8, characterized in that said first means comprise second means (14;3',4';70;76,CC;79) for the flow or circulation of a conditioning fluid (F) within said at least one duct or interspace (11,11b,11c,11d;11*;11[^]), preferably a gas or a liquid, in particular air or water.
- 15 10. Device according to the previous claim, characterized in that said second means (14;3',4';70;76,CC;79) are used for the flow or circulation of said conditioning fluid (F) within said at least one duct or interspace (11,11b,11c,11d;11*;11[^]) between said inlet (3,3';3[^]) and said outlet (4;4';4[^]).
- 20 11. Device according to one or more claims 7 to 10, characterized in that said first means also comprise an insulating coating (5;5[^]) applied externally to said body (2,30;2',30;2,31;C,2*;2[^]) and/or to said inner parts (12,30;30';31;12*;CE,12[^]), in particular covering the whole outer surface of the device (1;1*;1[^]) and/or of said inner parts (12,30;30';31;12*;CE,12[^]).
- 25 12. Device according to one or more previous claims, characterized in that said body (2,30;2',30;2,31;C,2*;2[^]) comprises a first container or outer container (7;50;7*;7[^]) and at least one second container or inner container (12;12*,A,H;12[^]) being suitable for containing at least a part of said elements and/or substances (10,30b;24;28,28u;10*;CE).
13. Device according to the previous claim, characterized in that said first outer container (7;50;7*;7[^]) and said second inner container (12;12*,A,H;12[^]) are connected by means of spacers (9;9*;9[^]) being suitable for defining said at least one duct or interspace (11;11*;11[^]).
- 30 14. Device according to the previous claim, characterized in that said spacers (9;9*;9[^]) have a geometry which minimizes the contact or thermal exchange area between said first outer container (7;7*;7[^]) and said second inner container (12;12*,A,H;12[^]), or in that said spacers (9;9*;9[^]) have a geometry which maximizes the thermal exchange area in contact

with the fluid (F).

15. Device according to claim 12 or 13 or 14, characterized in that said first outer container comprises a compartment (50) of said apparatus (40) with which said device (1;1*;1^) is suitable for operating.

5 16. Device according to one or more claims 9 to 15, characterized in that said second means comprise said inlet duct (3') and outlet duct (4), being located respectively at the bottom and at the top of said at least one duct or interspace (11;11*;11^), so as to facilitate the circulation by natural convection of said fluid (F) within said at least one duct or interspace (11;11*;11^).

10 17. Device according to one or more claims 9 to 15, characterized in that said second means comprise third means (14;76;79) being suitable for increasing the internal energy, i.e. the circulation of said fluid (F) within said at least one duct or interspace (11;11*;11^), said third means (14;76;79) being preferably associated with said inlet duct (3,3';3^) and/or said outlet duct (4;4';4^) of said at least one duct or interspace (11;11*;11^).

15 18. Device according to the previous claim, characterized in that said third means comprise a fan (14, 76; 79) or a compressor (76) or a pump for said fluid (F) or a Venturi-effect device.

19. Device according to claim 17 or 18, characterized in that said third means (14;76;79) belong to the apparatus (40) with which said device (1;1*;1^) is suitable for operating.

20 20. Device according to claim 17 or 18 or 19, characterized in that said third means (14;76;79) are used for performing further functions inside said apparatus (40) with which said device (1;1*;1^) is suitable for operating.

25 21. Device according to one or more claims 7 to 20, characterized in that it comprises fourth sensor means (18) being associated with the device (1) or with said at least one duct or interspace (11;11*;11^) for detecting thermodynamic parameters related to said fluid (F), in particular its temperature and/or pressure and/or humidity.

22. Device according to one or more previous claims, characterized in that it comprises and/or incorporates fifth means for managing and controlling the operation of said device (1;1*;1^) and/or of said apparatus (40), being used for insulating and/or conditioning said elements and/or substances (10,30b;24;28,28u; 10*;CE) and/or said inner parts (12,30;30';31;12*;CE,12^) of the device (1;1*;1^).

30 23. Device according to the previous claim, characterized in that said fifth means are used for receiving information from said fourth sensor means (18) and/or for activating and/or

controlling the operation of said third means (14;76;79).

24. Device according to one or more claims 9 to 23, characterized in that said second means for the flow and circulation of the fluid (F) comprise sixth means (13b,13c;51;60;66;70) for intercepting and/or diverting and/or distributing and/or adjusting the characteristics of at least a portion of the flow (F_I,F_{II}) of said fluid (F) circulating within said at least one duct or interspace (11;11*;11[^]).

5 25. Device according to the previous claim, characterized in that said sixth means comprise at least one flow diverter (13b) and/or one flow combiner (13c) being associated with said at least one duct or interspace (11;11*;11[^]) and typically located near said inlet (3,3';3[^]) and said outlet (4;4';4[^]), respectively.

10 26. Device according to one or more claims 9 to 25, characterized in that said second means for the flow and circulation of the fluid (F) comprise flow diverting elements (13) being used substantially for directing and/or guiding said fluid (F) everywhere within said at least one duct or interspace (11,11b,11c,11d;11*;11[^]).

15 27. Device according to claim 25 or 26, characterized in that said flow diverting elements (13) are obtained on at least one of the surfaces facing said at least one duct or interspace (11,11b,11c,11d;11*;11[^]).

20 28. Device according to the previous claim, characterized in that said flow diverting elements (13) are provided on the outer surface of said second container (12;12*,A;12[^]) and/or on the inner surface of said first container (7;50;7*;7[^]), in particular as arched fins obtained as an integral part of the container, being shaped in such a way as to form a number of channels for the flows (F₁, F₂) of said fluid (F) directed toward the farthest portions of said at least one duct or interspace (11,11b,11c,11d;11*;11[^]).

25 29. Device according to one or more claims 7 to 28, characterized in that said at least one duct or interspace comprises volumes or ducts (11b,11c,11d,11p) being substantially so shaped as to envelop at least a portion of said elements and/or substances (10,30b;24; 28,28u;10*) of said device (1;1*), said volumes or ducts (11b,11c,11d,11p) being preferably in fluid communication with said at least one duct or interspace (11;11*) during at least one operating condition of said device (1;1*).

30 30. Device according to one or more claims 9 to 29, characterized in that said first means comprise seventh means (67,68;43,75,77,78) for providing heat dissipation or thermal exchange between at least a portion of said circulating fluid (F) and an environment outside said device (1;1*;1[^]).

31. Device according to one or more previous claims, characterized in that said inner parts of said device (1;1*;1[^]) comprise a metering and/or distributing device (30;30';31) for at least a portion of said elements and/or substances (10, 28,28u;10*).
32. Device according to one or more previous claims, characterized in that said elements and/or substances comprise washing agents (10, 10*).
- 5 33. Device according to one or more previous claims, characterized in that said device is a container and/or dispenser device (1;1*) containing and/or dispensing washing agents (10,10*) and being suitable for being mounted or used on or in combination with a household appliance, preferably a washing machine (40), in particular a dishwasher.
- 10 34. Device according to claim 31, 32 or 33, characterized in that said metering and/or distributing device (30;30';31) comprises a shutter (30b;24; 31a,31b,32a,32b,33a,33b).
35. Device according to the previous claim, characterized in that said shutter is of an angular-motion or rotary type (24) or of a linear-motion type (30b), in particular a drum-type or box-type shutter.
- 15 36. Device according to claim 32, characterized in that said washing agents are in the form of tablets (28, 28u), said device (1) being shaped in such a way as to be capable of containing said tablets (28,28u).
37. Device according to claims 33 and 36, characterized in that said metering and/or distributing device (31) is used for metering and distributing said tablets (28,28u), preferably one at the time.
- 20 38. Device according to the previous claim, characterized in that said metering and/or distributing device (31) comprises movable elements (31a,31b,32a, 32b,33a,33b) being used for metering and/or distributing said tablets (28,28u) through actuation elements and/or kinematic systems, in particular linear or angular actuators or motors, so that said movable elements (31a, 31b, 32a, 32b, 33a, 33b) are suitable for moving and/or retracting at least partially within special seats (34) obtained in a body (31c) representing the structure of said metering and/or distributing device (31).
- 25 39. Device according to claims 29, 31, 34 and one or more claims 35 to 38, characterized in that said metering and/or distributing device comprises internally said volumes or ducts (11b,11c,11d,11p), being in particular so shaped as to envelop said portion of said elements and/or substances (10,30b;24;28,28u; 10*) of said device (1;1*) or at least a portion of said shutter (30b;24; 31a,31b,32a,32b,33a,33b).
- 30 40. Device according to the previous claim and claims 36, 37 or 38, characterized in that

said metering and/or distributing device (31) is structured and used for allowing said fluid (F) to flow onto at least one tablet to be dispensed (28u) during at least one operating condition (Figg.20 and 21) of said device (1).

41. Device according to claim 24, characterized in that said sixth means (51;60;66;70) are associated with said at least one duct or interspace (11,11b,11c,11d;11*;11[^]) of said device (1;1*;1[^]), preferably associated with said inlet (3,3';3[^]) and/or said outlet (4;4';4[^]) of said at least one duct and/or interspace (11).

42. Device according to claim 24 or the previous claim, characterized in that said sixth means (51;60;66) are used for achieving a pressurization of said fluid (F) within said at least one duct or interspace (11) of the device (1).

43. Device according to claims 17, 24 and 42, characterized in that said third means (14;76;79) are used in combination with said sixth means (51;60;66) for achieving said pressurization of said fluid (F) within the interspace (11) of the device (1).

44. Device according to claim 24 or 41 or 42 or 43, characterized in that said sixth means (51;60;66;70) are used for performing an adjustment of the flow rate of said fluid (F) within said at least one duct or interspace (11) of the device (1).

45. Device according to claim 17 and one or more claims 18 to 44, characterized in that said third means (14;76;79) are used for performing an adjustment of the flow rate of said fluid (F), preferably within said at least one duct or interspace (11,11b,11c,11d;11*;11[^]).

46. Device according to one or more claims 39 to 44, characterized in that it comprises a Venturi-effect device (66) being preferably located downstream said outlet (4) of the interspace (11) of the device (1), said conditioning fluid (F) being typically air.

47. Device according to claim 8 and one or more claims 41 to 44, characterized in that it comprises:

- third ducts (54, 55) associated with said inlet (3,3';3[^]) or said outlet (4;4';4[^]) of said at least one duct or interspace (11) of the device (1;1*;1[^]),
 - at least one fourth duct (56) being in fluid connection with at least one of said third ducts (54, 55) on one end and with an environment (46) inside said apparatus (40) on the other end, in particular said apparatus being a wash tub (46) of a dishwasher (40),
- 30 said sixth means (51;60;66;70) being used at the intersection between said at least one third duct (54, 55) and said at least one fourth duct (56) for adjusting the flow rates (FI,FII) of the fluid (F) circulating both within said at least one duct or interspace (11) and from or to said environment (46) inside said apparatus (40).

48. Device according to one or more previous claims, characterized in that said first means comprise a Peltier cell (67) associated with said body (2,30;2',30;2,31;C,2*;2[^]) of said device (1), in particular to absorb or yield heat.

49. Device according to claims 7 and 48, characterized in that said Peltier cell (67) has a first surface (67b) facing said at least one duct or interspace (11), preferably in order to extract heat from the fluid (F) circulating therein, and a second surface (67a) typically facing the environment outside said device (1), preferably in order to yield heat.

50. Device according to claims 30 and 49, characterized in that said Peltier cell (67) has said seventh means (68) in order to promote the heat exchange from said second surface (67a) to the environment outside the device (1), in particular said seventh means being a fan (68).

51. Device according to one or more previous claims, characterized in that said first means comprise a closed circuit (CC) which in its turn comprises at least one heat exchanger (75) for said fluid (F) circulating therein, said closed circuit (CC) being associated with said body (2,30;2',30;2,31;C,2*;2[^]) of said device (1) for insulating and/or conditioning said elements and/or substances (10,30b;24;28,28u;10*;CE) and/or inner parts (12,30;30';31;12*; CE,12[^]).

52. Device according to the previous claim, characterized in that said closed circuit comprises a coil (78) associated with said elements and/or substances (10,30b;24;28,28u; 10*;CE) and/or said inner parts (12,30; 30';31;12*;CE,12[^]) of said body (2,30;2',30;2,31;C,2*;2[^]) in order to exchange heat with the same.

53. Device according to claims 12 and 52, characterized in that said coil (78) is associated with said second container (12).

54. Device according to claims 8 and 52 or 53, characterized in that said coil (78) is associated with said at least one duct or interspace (11) of the device (1).

55. Device according to claims 8 and 51, characterized in that said at least one duct or interspace (11) of said device (1) is in fluid connection with said closed circuit (CC), preferably being a part of said closed circuit (CC).

56. Device according to claims 17 and 52 or 53 or 54 or 55, characterized in that said closed circuit (CC) comprises said third means (76) for the forced circulation of said fluid (F) within the same circuit.

57. Device according to the previous claim, characterized in that it comprises a refrigerating source (43,77) associated with said heat exchanger (75) in order to absorb heat

from said heat exchanger (75).

58. Device according to the previous claim, characterized in that said refrigerating source (43,77) comprises a tank for a liquid, in particular water, or a fan.

59. Device according to claim 57 or 58, characterized in that said closed circuit (CC) is structured and used for performing a refrigerating cycle, in particular said third means comprising a compressor (76) for the fluid (F) circulating within the closed circuit (CC).

60. Device according to claims 7 and 59, characterized in that said at least one duct or interspace (11) represents at least a portion of the volume from which the fluid (F) absorbs heat inside the device (1).

10 61. Device according to claim 22 or 23 and one or more of claims 51 to 60, characterized in that it comprises said fifth means, which are used for activating and/or adjusting said closed circuit (CC).

15 62. Device according to one or more claims 51 to 54, characterized in that said closed circuit (CC) is at least a part of a so-called "heat pipe" device, i.e. of a type being suitable for creating a spontaneous internal circulation.

63. Device according to claim 8, characterized in that said at least one duct or interspace (11) is a part of a fluid circuit (F), in particular an hydraulic circuit, being integrated into said apparatus (40).

20 64. Device according to the previous claim and claim 24, characterized in that it comprises said sixth means (70), which are used for controlling and/or adjusting the flow rate of said fluid (F) circulating within the interspace (11).

65. Device according to claim 63 or 64, characterized in that said fluid circuit (F) is part of an hydraulic circuit of a household appliance or a washing machine (40), said fluid being preferably water.

25 66. Device according to the previous claim, characterized in that said hydraulic circuit is part of an hydraulic circuit of a dishwasher (40), being preferably comprised in the section from the air-break device (42) to the tank (43) for collecting the water (F) supplied from the main, in particular upstream the inlet of a water softener (45).

30 67. Device according to one or more claims 3 to 66, characterized in that said body comprises a plurality of containers (A,H) for said elements and/or substances (10,30b;24;28,28u;10*;CE).

68. Device according to claims 7 and 67, characterized in that said at least one duct or interspace (11*) surrounds , at least partially, said plurality of containers (A,H).

69. Device according to the previous claim, characterized in that said at least one duct or interspace envelops each container of said plurality of containers.
70. Device according to one or more previous claims, characterized in that said device is a dispensing device (1;1*) for dispensing washing agents (10;10*).
- 5 71. Device according to claims 70 and 67 or 68 or 69, characterized in that said plurality of containers comprises at least one container (A) for some first washing agents (10) and at least one container (H) for some second washing agents (10*).
- 10 72. Device according to the previous claim, characterized in that said dispensing device (1*) is of a type being able to distribute a single dose of said first washing agents (10) and a plurality of doses of said second washing agents (10*).
73. Device according to claim 70 or 71 or 72, characterized in that said dispensing device (1;1*) is of a type being suitable for applications on dishwashers (40).
- 15 74. Device according to the previous claim, characterized in that said dispensing device (1*) is of a type being suitable for being used in association with an element or panel (20) of a door of a dishwasher (40), said second agents preferably consisting of a rinse aid.
75. Device according to claim 70, characterized in that said dispensing device (1) is of a bulk or high-autonomy type or of a type being suitable for distributing a plurality of said washing agents (10;28,28u).
- 20 76. Device according to one or more claims 70 to 75, characterized in that said washing agents are in granular (10) or liquid (10*) or solid form, in particular comprising tablets (28,28u).
77. Device according to one or more previous claims, characterized in that said elements and/or substances being present in said body (2,30;2',30;2,31;C,2*;2^) and/or said inner parts being present in said body (2,30;2',30;2,31;C,2*;2^) comprise an electronic circuit (CE).
- 25 78. Device according to the previous claim, characterized in that said electronic circuit (CE) is at least a part of a further electronic circuit, said further electronic circuit being preferably present in said apparatus (40).
79. Device according to claim 77 or 78, characterized in that said electronic circuit comprises a management control unit or the electronic control system of said device (1^) and/or of said apparatus (40).
- 30 80. Device according to one or more claims 77 to 79, characterized in that it has a connector (90) being connected to the electronic circuit (CE) in order to provide a wiring

outside the device (1[^]).

81. Device according to claim 79 or 80, characterized in that it comprises an inner container (12[^]) made of a thermally conductive material, the electronic circuit (CE) being used for dissipating heat through said inner container (12[^]).

5 82. Device according to the previous claim, characterized in that said inner container (12[^]) is made of an electrically insulating material, being in particular used for enveloping said connector (90) up to the point where it goes through an outer container (7[^]), the latter being preferably made of a thermo insulating material.

10 83. Device according to one or more previous claims, characterized in that said apparatus being suitable for producing temperature variations, in particular temperature rises, during at least one phase of their operation, are apparatus for household washing or for heating sanitary water, i.e. boilers, apparatus for cooking, i.e. ovens or cookers, apparatus for ironing, i.e. irons and associated boilers, or apparatus installed on vehicles, in particular motor vehicles.

15 84. Device according to the previous claim and one or more claims 79 to 82, characterized in that said management unit or electronic control unit of said device (1[^]) and/or of said apparatus (40) comprises an electronic control unit of a system for managing the operation of an endothermic engine or of accessories of a vehicle, in particular electrical servo-assisted mechanisms, or of any actuation and/or diagnosis systems of said vehicle.

20 85. Device according to claim 31, characterized in that said washing agents consist of a window wash fluid, the device being a window wash fluid container and/or dispenser, in particular for applications on vehicles, specifically cars.

86. Device according to one or more previous claims, characterized in that said first means comprise heating means (67).

25 87. Device according to the previous claim, characterized in that said heating means (67) are preferably associated with said elements and/or substances (10,30b;24;28,28u;10*:CE) being present in said body (2,30;2',30;2,31;C,2*;2[^]) and/or with said inner parts (12,30;30';31;12*:CE,12[^]) being present in said body (2,30;2',30; 2,31;C,2*;2[^]) of said device (1;1*;1[^]), said heating means (67) being used for heating said elements and/or substances (10,30b;24;28,28u;10*: CE) and/or said inner parts (12,30;30';31;12*:CE,12[^]) and/or said fluid (F) circulating within said at least one duct or interspace (11,11b,11c,11d;11*;11[^]).

30 88. Device according to claim 22 and one or more claims 23 to 87, characterized in that

said fifth means are used for the purpose of keeping said conditioning fluid (F) within a certain temperature range.

89. Device according to the previous claim, characterized in that said certain temperature range is predefined and/or set by the user through appropriate commands of a control unit of said apparatus (40), said temperature range being in particular automatic or automatically calculated by said control unit.

90. Apparatus, characterized in that it comprises, mounted on or used in combination with the same apparatus (40), a device according to one or more claims 1 to 89.

91. Apparatus according to the previous claim, characterized in that it is suitable for producing temperature variations, in particular temperature rises, during at least one phase of its operation.

92. Apparatus according to claim 90 or 91, characterized in that it is a washing machine.

93. Apparatus according to claim 92, characterized in that it is a dishwasher.

94. Apparatus according to claim 92, characterized in that it is a laundry washing machine.

95. Apparatus according to claim 90 or 91, characterized in that it is substantially an apparatus for heating sanitary water, i.e. a boiler, an apparatus for cooking, i.e. an oven or a cooker, or an apparatus for ironing, i.e. an iron and an associated boiler.

96. Apparatus according to one or more claims 90 to 95, characterized in that it is suitable for being placed in and/or on vehicles, in particular motor vehicles.

97. Method for actuating and/or controlling the state of a device having a body (2,30;2',30;2,31;C,2*;2^), being structured for containing elements and/or substances (10,30b;24;28,28u;10*;CE) and having a number of inner parts (12,30;30';31;12*;CE,12^), said device (1;1*;1^) being suitable for being mounted or used on or in combination with apparatus (40) capable of producing temperature variations, in particular temperature rises, during at least one phase of the operation of said apparatus (40), characterized in that it actuates and/or controls a thermal insulation and/or conditioning of said body (2,30;2',30;2,31;C,2*;2^), in particular with the aid of first means (F,11,14,18,19;76;67;75,CC,77;11*;79;11^) being used for insulating and/or conditioning said elements and/or substances (10,30b;24;28,28u;10*;CE) and/or said inner parts (12,30;30';31;12*;CE,12^) against thermal flows typically caused by said apparatus (40), in order to prevent any deterioration of said elements and/or substances (10,30b;24;28,28u;10*;CE) and/or any anomalous behaviour of said inner parts (12,30;30';31;12*;CE,12^) being present in said body (2,30;2',30;2,31;C,2*;2^).

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98. Method according to the previous claim, characterized in that said thermal insulation and/or conditioning is actuated and/or controlled when sensor means (18) associated with said device (1;1*;1[^]) detect certain thermodynamic characteristics, in particular the temperature of a fluid (F) and/or of said elements and/or substances (10,30b;24;28,28u;10*;CE) and/or inner parts (12,30; 30';31;12*;CE,12[^]) of said device (1;1*;1[^]) and/or of parts (20) being associated with said device (1;1*;1[^]), to be outside certain parameters stored in memory means being present in a control unit of a management system of said device (1;1*;1[^]) and/or of said apparatus (40) with which the device (1;1*;1[^]) is associated; said parameters being set in such a way as to prevent any anomalous behaviour of said elements and/or substances (10,30b;24;28,28u;10*;CE) and/or inner parts (12,30; 30';31;12*;CE,12[^]) of said device (1;1*;1[^]).

99. Method according to the previous claim, characterized in that said thermal insulation and/or conditioning is actuated and/or controlled when said sensor means (18) detect the presence of a certain value of humidity and/or temperature of said fluid (F) being outside a preset temperature range or value stored in said control unit, said range or value being in particular predefined and/or set through appropriate commands of said control unit.

100. Method for actuating and/or controlling the state of a device according to at least one of claims 1 to 89.

101. Method for actuating and/or controlling the state of a device associated with an apparatus according to one or more claims 90 to 96.